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its middle point M is the centre of gravity of the A_λ, and if P is any point in space at a distance a from M, then $\sum\limits_{\lambda} PA_\lambda = n(R^2 + a^2)$"]; "Muss die Sonne ihren höchsten Stand immer im Meridian erreichen"? by P. Kiesling, 34–35; "Die Kugel als regelmässiger Vielflächner" by F. Elsas, 36–37; "Zur Maclaurins Trisektrix, zur Kissoide und zur Versiera" by A. Peschke, 37; "Zur Lehre von den harmonischen Strahlen" by J. Mahrenholz, 37; "Ueber eine Beziehung zwischen Normale und Brennstrahlen in einem Punkte einer Ellipse" by J. Mahrenholz, 37–38; Various other brief notes, 38–40.

ZEITSCHRIFT FÜR MATHEMATISCHEN UND NATURWISSENSCHAFTLICHEN UNTERRICHT, volume 51, no. 4–5, published May 20, 1920: "Das d'Hondtsche Wahlsystem." "Eine Anwendung der graphischen Methoden" by E. Sós, 89–93; "Mathematische Betrachtungen über das geltende politische Wahlverfahren" by H. Franke, 94–106; "Arbeit und Boden in der Volkswirtschaftslehre und Mechanik" by J. Braun, 106–109; "Optische Geometrie" by R. Böger, 110–118; "Eine neue Verallgemeinerung des pythagoräischen Lehrsatzes" by A. Voigt, 118–122; "Das Ecktangentendreieck" by J. Mahrenholz, 123; "Der Saccheri-Legendresche Satz lautet: Ist in einem einzigen Dreieck die Winkelsumme $\lesseqgtr$ 180°, so ist sie es in jedem" by K. Fladt, 124–125 [a very simple proof for the Euclidean case, which, however, the author states he has not yet succeeded in extending to the non-Euclidean cases;] "Aufgabenrepertorium," 126–132; "Bücher, besprechungen," 140–141.

UNDERGRADUATE MATHEMATICS CLUBS.

EDITED BY U. G. MITCHELL, University of Kansas, Lawrence.

Last month we gave some account of two new clubs, the "Pascal Circle" of Trinity College, Washington, D. C., and "The Square" of Washington Square College, New York City, which had not been previously reported. This month our readers will note among the "Club Activities" an account of a third new club, "The Cornell Parabola," organized in November 1919 at Cornell University, Ithaca, N. Y.

The editor of this department has recently enjoyed the privilege of examining a copy of the "*Proceedings of the Johns Hopkins University Mathematical Club*, edited by G. Breit and F. V. Morley and printed by Corona Morley."[1]

It is a typewritten volume of about sixty pages, bound in manila paper covers, and reports the nine meetings held in March, April and May, 1920. Many of the formal papers and solutions of problems presented are recorded in full. Others are given in abstract form only. The editors have added to the interest and value of the record by inserting comments and "gleanings" from mathematical literature in connection with the subjects discussed. As an illustration of these "gleanings" we select the following, inserted (p. 34) in connection with a paper on "Quaternions" by Professor Murnaghan:

"'Comparing a Quaternion investigation, no matter in what department, with the equivalent Cartesian one, even when the latter has availed itself to the utmost of the improvements suggested by Higher Algebra, one can hardly help making the remark that they contrast even more strongly than the decimal notation with the binary scale, or with the old Greek arithmetic—or than the well-ordered subdivisions of the metrical system with the preposterous no-systems of Great Britain, a mere fragment of which (in the form of Table of Weights and Measures) form, perhaps the most effective, if not the most ingenious, of the many instruments of torture employed in our elementary teaching.'—P. G. TAIT. (Quoted by MORITZ, *Memorabilia Mathematica*, p. 280.)

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[1] "Corona Morley" refers, as the reader doubtless recognizes, to Mr. Morley's typewriter. The humorous touch added by this bit of personification is supported throughout by occasional references to Corona as, for example, the following (p. 12):

"No account of Mathematical Prodigies will hereafter be complete without reference to Corona Morley. Barely a week old, she is nevertheless able to talk about the Gamma function. The editors wish the best of success to her acquisitive and expository powers."

'Quaternions came from Hamilton after his really good work had been done; and though beautifully ingenious have been an unmixed evil to those who have touched them in any way, including Clerk Maxwell.'—WILLIAM THOMSON. (Quoted by MORITZ, *Memorabilia Mathematica*, p. 279.)

So T and T′ disagree
On parts of their philosophy."

It may be possible that other clubs are keeping similarly complete records of their proceedings. If so, the editor would be glad to have the fact reported.

CLUB ACTIVITIES.

THE CORNELL PARABOLA, Cornell University, Ithaca, N. Y.

The Cornell Parabola was organized by the students of the upper classes in November, 1919. It was modelled along the lines of the Oliver Mathematical Club, which has existed among the faculty members for many years, and the organization was very informal. There is no constitution, there are no dues and there are only two officers—a chairman, popularly known as the "Focus" and a secretary, better known as the "Directrix." A program committee consisting of four students and one faculty member planned the work.

The attendance for all of the meetings averaged over fifteen and there were always spirited discussions and incidental problems at the close of each program.

The only social event of the year was the Christmas party which was held at the home of one of the professors. The chief game of the evening was a contest in supplying mathematical terms for the missing words in a "Romance of Polly Hedron and Ray Show." There was a Christmas tree loaded with candy boxes in all the regular polyhedron shapes.

The officers of the club were: Chairman, Theodore L. Bennett '21; secretary, Elfrida Heath '20; chairman program committee, Nellie G. Tallman '20; faculty adviser, Dr. Helen B. Owens.

Programs for the year 1919–20 are given below.

"Reliability of averages" by Herbert Sturges, Gr; "Properties of determinants" by Theodore L. Bennett '21; "The ancients' knowledge of mathematics" by Elfrida G. Heath '20; "Some applications of mathematics to physics" by Roy Kennedy '21; "College students' errors in mathematics" by Alan D. Campbell, Instructor in Mathematics; "Fallacious proofs in geometry" by Professor Frederick W. Owens; Parabola Christmas Party; "Possible constructions with straight edge and compass" by Professor Owens; "Topics from mechanics and hydraulics" by Salvador Quinones '21; "Famous problems of mathematics" by L. Kalles '19; "Consequences of a triangular unit of area" by Professor Walter B. Carver; "Properties of the parabola" by Allen D. Campbell, Instructor in Mathematics; "The theory of the pendulum" by Joseph A. Beeker '19; "Research problem in electricity" by Ruth Yeaton, Gr; "Value of mathematics to the engineer" by Burdette K. Northrup '19; "Value of mathematics to the physicist and chemist" by Austin Bailey, Gr.

THE MATHEMATICAL CLUB, Harvard University, Cambridge, Mass.
[*1918*, 186–7, 449–50; *1919*, 262–3.]

The officers for 1919–20 were: President, Joseph L. Walsh, Gr.; secretary-treasurer, Harold T. Davis, Gr.; faculty adviser, Professor William C. Graustein.

Programs for 1919–20 are given below.

October 1, 1919: "The elementary functions" by Professor William F. Osgood.
October 15: "Problems connected with submarine acoustics" by Professor Oliver D. Kellogg.
October 29: "Elementary notions of general analysis" by Dr. Israel A. Barnett, Instructor.
November 12: "Correlation" by Professor Edward V. Huntington.
December 3: "Linkages" by Bancroft H. Brown, Instructor.
December 17: "Nomography" by Rexford S. Tucker, Gr.
January 7, 1920: "Numerical integration" by Charles A. Rupp, Instructor.
February 11: "The application of the method of least squares to some geometrical problems" by Professor Julian L. Coolidge.
February 25: "Operations generating algebra" by Dr. Norbert Wiener, Instructor in Mathematics, Massachusetts Institute of Technology.
March 10: "Approximation to continuous functions" by Lewis E. Ward, Gr.
March 24: "Rectifiable and other curves" by Professor Edward B. Van Vleck, Professor of Mathematics, University of Wisconsin.
April 7: "Polygons whose vertices lie on a convex curve" by Forrest H. Murray, Gr.
April 28: "Surfaces of negative curvature" by Dr. Harold C. M. Morse, Instructor.
May 12: "A solution of the biquadratic" by Professor William C. Graustein.
May 24: "The location of the roots of the derivative of a polynomial" by Joseph L. Walsh, Gr.

Officers-elect for the year 1920–21: President, Rudolph E. Langer, Gr.; secretary-treasurer, Bancroft H. Brown, Instructor; faculty adviser, Professor Oliver D. Kellogg.

THE MATHEMATICAL CLUB OF SMITH COLLEGE, Northampton, Mass.
[*1918*, 91, 455; *1920*, 184.]

Below are given the programs for the year 1919–20.

October 20, 1919: Discussion of plans for the year. Reports of the September meetings of the American Mathematical Society and the Mathematical Association of America.

November 10: "Map drawing, with special reference to the use of maps in the Great War" by Professor Suzan R. Benedict.

December 1: "Leibnitz" by Ellen Hastings '20; "Descartes" by Marjorie Lord '20; "Newton" by Helen Frank '20.

December 15: Christmas Party.

February 19, 1920: "Applications of mathematics" by Margaret Doran '20.

March 8: "Introductory paper concerning the three famous problems of antiquity" by Agnes Grant '20; "Trisection of the angle" by Isabel Painter '20; "Squaring the circle" by Miriam Courtney '20.

April 12: "Duplication of the cube" by Carolyn Boudo '20; "The Pythagorean theorem" by Ruth Colsten '20.

May 3: "A study of transformations" by Dorothy Graves '21.

May 24: Spring Party.

THE PASCAL CIRCLE, Trinity College, Washington, D. C.

[*1920*, 425.]

An account of this club's activities for the year 1919–20 was given last month. No previous account of the club having appeared in this department, an inquiry was addressed to Professor Marie Cecelia Mangold concerning the previous history of the club. The information given below was received in reply.

The Pascal Circle was founded in October 1916 with the following officers: President, Anna Marie Lawler '17; secretary, Zita Louise Donahoe '17.

Two meetings per month were held and some of the topics discussed were the following: The mathematical basis of magic number cards and tricks with cards—Geometrical fallacies—Popular "catch" problems—Magic squares and magic pencils—The arcascope and the slide rule—Geometric paper folding—The Pascal triangle and the Pascal theorem—Nine-point circle.

Officers for the year 1917–18 were: President, Virginia Alma Keller '18; secretary, Frances Dix Wyman '19. Some meetings were held in the fall of 1917, but on account of sickness the Circle was disbanded until late in the year 1918–19 when it was reorganized with Katherine Mary Martin '19 as president and Beatrice Agnes Convey '20 as secretary. Three of the subjects discussed that year were: Locating machine guns by means of sound—The mathematical principle underlying the Russian peasant method of multiplication—Ciphers and cryptograms.